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ABSTRACT

This report discusses the use of performance indicators (PIs) in higher education, focusing on definitions, frameworks, examples, and implications for universities. It notes that demands for accountability have led to intense interest in university performance measures, and that early indicators simply described the university or the system and hence had limited impact on policy or management decisions. True PIs are: (1) goal or result oriented; (2) have a reference point; (3) provide strategic information about the condition or functioning of an institution; (4) are evaluative; (5) are strategic, specific, policy-orientated, and issue-driven; (6) connect outcomes to structure and process, taking inputs into account; and (7) are used for improvement, enhancement, and positive reform. The report asserts that PIs can best be used for internal university purposes to enhance the quality of education, research, community service, and other functions. It argues that PIs are not absolute facts, and that they are best interpreted as indicative, suggestive, or diagnostic. (MDM)

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RESEARCH FILE

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A primer on performance indicators

There is currently a great deal of interest in performance indicators for Canadian universities. Much has been written on the subject. The purpose of this primer is to clarify concepts, to highlight problems and to suggest how performance indicators are best used and interpreted in higher education.

This information will be useful to members of university governing boards, administrators, faculty, politicians, government officials, media representatives and other partners of the university community.

The unprecedented interest in performance indicators in education transcends school boards, colleges, universities, provinces and even nations. The focus on performance indicators is not simply a response to local or particular conditions, but represents a general issue spanning a wide variety of jurisdictions.

There are a number of reasons for the interest in performance indicators in higher education. Advanced education has emerged as a priority public issue for governments. University education is recognized as a strategic, human resource investment which should contribute to building a knowledgeable, creative, innovative and advanced labor force — capable of succeeding in global competition and generating economic growth in Canadian society. At the individual level, investment in higher education is expected to lead to meaningful work, high income and an excellent quality of life.

But despite the high level of overall satisfaction with universities revealed by opinion polls, there has been growing public and government disenchantment with university education in terms of

Highlights

- Demands for accountability have led to intense interest in university performance measures — but often there is not a clear understanding of what a performance indicator really is.
- Early indicators simply described the university or the system and hence had limited impact on policy or management decisions.
- A performance indicator is a policy relevant statistic, number or qualitative description that provides an indication that the university, some aspect of it, or the university system is performing as it should.
- Key features of performance indicators:
  - are goal or result oriented — related to missions or outcomes;
  - have a reference point — a target, performance over time or comparison across institutions;
  - provide strategic information about the condition, health or functioning of the institution/system;
  - are evaluative — the purpose is to assess, judge;
  - are strategic, specific, policy-oriented and issue-driven;
  - connect outcomes to structure and process, taking inputs into account;
  - are used for improvement, enhancement, positive reform.
- Performance indicators can best be used for internal university purposes to enhance the quality of education, research, community service and other functions.
- Performance indicators are not absolute facts carved in stone. They are best interpreted as indicative, suggestive or diagnostic.

Goals must be clear

If the goals of education are vague or undefined or if the ways to achieve them are unknown, "... then no information is useful and anything or nothing will serve as an indicator." (OECD, ***Indicators of Performance of Educational Systems****, Paris, 1973)*

standards, quality, employability and skills of graduates. Moreover, higher education is expensive. In this period of fiscal restraint, the emphasis is on "value for money", or ensuring that funds invested in public education are well spent. Increased demands for accountability throughout all sectors of society have led to an interest in performance and outcome measures. (These measures represent the "value" component of the "value for money" equation and include non-material or non-economic outcomes such as knowledge, thinking and reasoning skills, and citizenship and democratic values.)

Universities themselves recognize the need to adapt to the fiscal realities and seek new information on which to base decisions concerning efficiency, effectiveness and productivity. Comparisons and assessments of educational functioning — the use of performance indicators — are seen as ways to improve the quality of education.

Today, with improvements to accessibility, university education has become mass education. Removed from the exclusivity and elitism of the past, universities are now more prone to be held up to common yardsticks.

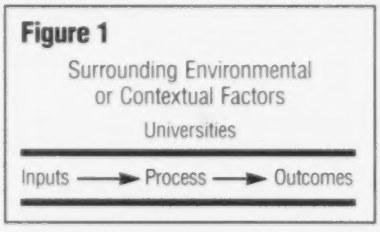
An indicator framework

Educational indicator frameworks often employ the *input - process - outcome* model, all conditioned by environmental or surrounding contextual aspects. *Inputs* represent what universities start with (students, teachers, instructional and facilities characteristics). *Process* refers to what universities do with the inputs (programs and processes such as curricula, faculty workload, instructional organization, use of technology, student/teacher time, student/teacher ratios, institutional climate). *Outcomes* are the cognitive (achievement or value-added) and non-cognitive effects of the university experience on students (work, incomes, skills, attitudes and behaviors). The environmental variables represent the context within which all of this occurs. The surrounding context includes such matters as demographic, economic, socio-cultural, social goals and cultures, historical matters, regional and political aspects — generally, those factors which impinge on institutions but are beyond their influence or control.

Increased demands for accountability throughout all sectors of society have led to an interest in performance and outcome measures.

For example, a university may admit only students with high school averages of 85 per cent or better (*high quality inputs*), have them attend first-year classes in large lecture halls (*process: large class sizes, many students per instructor*) and use multiple choice tests to measure *cognitive outcomes*. All of this may occur within the *context* of physical and economic constraints on enrolment and resources.

Figure 1



Objectives are reference points

"Although based on the same data as management information, performance indicators serve a different purpose. They are most relevant in normative evaluation processes which seek to assess the extent to which a program, a practice or a policy is meeting its stated objective. The objectives serve as a guide or a reference point to assess performance against oneself over time and are essential when comparing performance to other institutions."
***(Measuring Up: Using Indicators to Manage Change,** workbook, AUCC, 1994)*

Consequently, there are many educational indicators, not all of which are performance indicators. Early indicators in education were limited to the economic, financial, resource or outcome dimensions without regard to the processes of education or to the local, environmental or regional context. As such, these early indicators or "descriptors" were severely constrained in terms of informing policy or management decisions.

There appears to be a growing recognition that intended goals and means are important aspects in the construction of meaningful education indicators. Initial indicators tended to be descriptive, often anything and everything to which a number could be attached. More recent interest is directed to evaluative or policy questions. Attention has shifted from input indicators to process and output measures and to probably the most fundamental performance measure — analysis which links university structures and processes to student learning and development outcomes, controlling for input characteristics. This represents in education, as it does in business, an indication of the value-added by activities for which institutions are held responsible and over which they have some control. Hence the term *performance* indicator.

The level of analysis regarding indicators has changed from a "macro" or national perspective to a more "micro" or institutional approach. Universities are less interested in comparing their performance to some general and often meaningless national average. They are more interested in comparing their current performance to their past performance or to their stated mission, goals or objectives, or to other institutions with similar contexts and purposes. Universities also appear to be concerned about best practices in education which have been shown to work in certain circumstances and situations and which could be adapted or modified for their use. This change in the level of analysis has occurred partly in response to the increased emphasis on using performance indicators for reform and improvement of education at the management or practical level.

In short, the focus for education indicator development has moved from descriptive questions about quantity (how many or how much in terms of student enrolment, graduations, attrition) to analytical questions about quality and performance. How good are the outcomes and how much of that is the direct result of university practices, programs and instruction?

Definition: what performance indicators are — and what they are not

A performance indicator is a policy relevant statistic, number or qualitative description that provides a measure of whether the university, some aspect of it, or the university system is performing as it should.

In order to assess whether or not a university is achieving its goals, it is necessary to have an explicit statement of what those goals are, and the realistic possibility of measuring performance in achieving the objectives. If the purposes of university education are vague or undefined, as is often the case with university mission statements, or if the means of achieving the goals are similarly ambiguous and unspecified, then any number

Concepts, not calculations

"The most complex problem is not the calculation of valid indicators but the classification of concepts." (Norberto Bottani and Herbert J. Walberg, "What are international education indicators for?" in ***The OECD International Education Indicators: A Framework for Analysis****, Centre for Educational Research and Innovation, OECD, Paris, 1992)*

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or statistic can be described as a performance indicator. But these are not very meaningful. An explicit statement of objectives or goals is necessary to serve as a guide or a reference point in measuring university performance over time or when comparing performance across institutions.

This reference point is what distinguishes *management statistics* from performance indicators. *Management statistics* describe the various characteristics of an institution or system such as enrolments, degrees granted, number of faculty and staff, revenues, expenditures and the like. Management statistics become *management information* when they are related to each other in a structured manner in support of management or control functions. While such information can be used to inform management decisions, it is primarily collected and used for internal and external reporting and monitoring purposes. Management statistics and information do not pretend nor seek to assess a university's performance in a direct or comprehensive sense. Instead, they are best regarded as primarily descriptive.

A *performance indicator*, on the other hand, is a quantitative or qualitative reading which provides strategic information about the condition, health or functioning of the institution or system. Performance indicators have a comparative dimension or a reference point that permits a value judgment to be made about the university or university system. The comparison or reference point may be a goal or an objective, an absolute standard, a past value (comparison over time) or a comparison across universities, regions or countries. A performance indicator, therefore, does exactly that — it permits an assessment, judgement or evaluation to be made about the performance of the institution or system.

Examples of well-used performance indicators

One good example of a performance indicator is found in the literature surrounding the first-year experience of university and college students (or the freshman year experience, as it is called in the United States). In response to concerns over high first-year drop-out rates, student performance (academic preparedness), and student adjustment problems in the first year of study, many universities have offered introductory courses designed to ease the transition to university and enhance student success. These are often called Introduction to Higher Education, University 101 or freshman seminars. The performance of these courses in meeting their objectives has been assessed by comparing grades, retention rates and student satisfaction between students who have taken and those who have not taken these courses. The evaluation results show that students who have completed these "first year experience" courses have higher grades, retention and graduation rates and report greater satisfaction with their education and greater learning.

For example, assessment of one first-year course shows a higher retention rate for completers (84 per cent) than for the entering class as a whole (61 per cent). The difference between the two retention rates, 23 percentage points, represents a performance indicator of the effectiveness of the course. Similarly, 41 per cent of the course completers graduated within four years compared to 25 per cent for the entering class as a whole (1986-1989). The 16 percentage point difference in four-year graduation rates provides

How good — not how many

"The key policy questions have turned from 'how many?' and 'how much?' to 'how good'?" (Desmond Nuttall, "The functions and limitations of international education indicators" in ***The OECD International Education Indicators: A Framework for Analysis****, Centre for Educational Research and Innovation, OECD, Paris, 1992)*

another indication that the first-year experience course is meeting its goals and objectives.[1]

Sceptics are quick to attribute the positive outcomes to self-selection. They charge that the better, more committed and dedicated students are taking these courses and this is what produces the positive results. When it is revealed that students who take these courses have lower grades at entry than the comparison group or that the analysis controls for the effects of high school grades, the criticism disappears and the true picture is revealed.[2] When the effects of self-selection are removed, these courses still produce an independent positive effect upon student success.

This example illustrates a number of features of performance indicators. They work best when grounded in a particular issue. They are issue-specific or issue-driven. The issue provides the context, rationale and detail around which to organize the assessment of performance. In the case above, the issue was the transition to university, retention and graduation. A specific course structure was compared to the general program to see which performed better.

In addition, as the example makes clear, it is not a simple task to evaluate whether or not an objective or goal has been achieved. In this case it was necessary to compare two groups of students on their performance (those taking and those not taking the course) and to hold constant their initial performance level so that any outcomes could reasonably be attributed to the course and not to better inputs to the course (self-selection). It is not enough to demonstrate positive results. It has to be demonstrated that these have occurred as a direct result of educational structures or processes, such as courses, programs, and instructional practices, rather than as a result of other factors. The performance of educational structures and processes are assessed for their consequences, independent of other influences.

Examples of poor use of performance indicators abound. Quite often anything that a number can be attached to is called a performance indicator.

Other good examples of performance indicators are literacy and numeracy tests administered to students at university entry and at exit. All other things being equal (initial motivation, subsequent non-university experiences), the differences between the entry and exit scores would represent the gains made due to university education.

Similarly, behavioral or proxy measures of the knowledge, skill and value outcomes of universities (distinguished from non-university and maturation effects), net of input characteristics, are good indicators of university performance.

The dearth of meaningful performance indicators in practice illustrates the difficulty in developing such indicators.

Examples of poorly used performance indicators

Examples of poor use of performance indicators abound. Quite often anything that a number can be attached to is called a performance indicator. Class sizes are a case in point. Frequently, average class sizes or faculty/student ratios are used as an indication of the quality of education.

Practical leadership

"... perhaps the best approach for the higher education institutions to adopt would be to be 'pro-active' and assume a practical leadership function, and perform this with confidence and 'authority'....this could well be the best way of ensuring that there is no forfeiture or subservience and that the discussion of the real issue of quality is not unwisely postponed." (Pierre Lucier, "Performance indicators in higher education: lowering the tension of the debate" ***Higher Education Management, Vol. 4, No. 2****, July 1992)*

Research shows, however, that there is little or no relationship between class size and course grades, standardized achievement scores, student satisfaction and learning. It is more important to look at what actually goes on *in the classroom* than to focus on the size of the class. (See *Research File* volume 1, number 1: Quality Education: Does Class Size Matter?) When this is done, instructor characteristics, course organization and management, including meaningful faculty-student and student-student contact and active participation and involvement are more important than the size of the class. In other words, class size does not provide a good indication of quality, and consequently, is not a reliable measure of performance.

Another example is "the number of books in the library" indicator. In fact, it could be taken as indicating the resources available to students and faculty. However, performance indicators deal with actual performance, use or consequence — not what might be used if people were so inclined. It is not the **possibility** of use but the **actual** use and its consequences that are important.

Use of performance indicators: some cautions and caveats

Performance indicators are best used to gauge the performance of a system, university, or structure or process within an institution. These indicators should be problem-oriented and policy-relevant so that decisions can be taken to improve university education. Progress and improvement in the delivery of education is the ultimate benchmark. Why use performance indicators, if not to improve performance? In order to assess this performance, it is necessary to separate out other influences which may have caused the performance to occur. In practice this is difficult, if not impossible, to do. Thus, some cautions and caveats are appropriate.

Suppose a university discovered that more students were retained from year-to-year and that more students were completing their programs than was previously the case (a single institution comparison over time on a desired outcome — retention and graduation). Would it be reasonable to conclude that the institution was doing a better job, i.e. performing better, than in the past? Not necessarily, especially if an economic recession had eliminated alternatives (employment). Or if, in response to financial constraints, the university has raised admission averages, thereby admitting a greater proportion of women, who coincidently have a better degree completion rate than men. In this case, it would be the context — an economic recession — and an input characteristic — gender — which have resulted in the better performance, not anything the institution actually did better in departments, programs or teaching.

Since changes in indicated performance over time cannot be linked with certainty to their causes, and since it is impossible to rule out other influences in producing desired performances, results must be interpreted with much caution. Performance indicators are best interpreted as indicative, suggestive or diagnostic rather than as objective and absolute facts carved in stone. In the first-year experience example discussed earlier, what would the judgement or assessment have been if the treatment effects were around two to five per cent instead of 16 to 23 per cent? Judgement and interpretation are required in the establishment

of thresholds or standards for program success. It is also useful to have multiple indicators and multi-method approaches in assessing progress towards objectives. It is appropriate to be open-minded, sceptical and tentative when interpreting performance indicators.

Implications

The general concern over university standards, quality, and the employability and skills of graduates exists because there are virtually no university outcome measures. The development of performance indicators that relate university outcomes to educational processes and structures would reduce public and government anxiety. Much of this anxiety occurs because there are so few measures that indicate whether universities are performing as expected.

In order to generate these indicators, there must be an explicit statement of goals (university mission statements or objectives) and an assessment of educational practices. When these assessments are made, there may be less public and government concern about the performance of universities.

Performance indicators should not be developed merely to justify university activities to external bodies. If they are used primarily for external reporting purposes, a key opportunity has been missed. Performance indicators can best be used for internal university purposes to improve and enhance the quality of education, research, community service and other institutional functions. There is an internal need for new information on the effectiveness of university activities.

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